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IS 5872 (1990): Cold Rolled Steel Strips (Box Strappings)
[MTD 4: Wrought Steel Products]

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“Knowledge is such a treasure which cannot be stolen”



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Indian Standard

**COLD ROLLED STEEL STRIPS
(BOX STRAPPINGS) — SPECIFICATION**

(Second Revision)

भारतीय मानक

अतप्त वेल्लित इस्पात पत्तियां (बक्सा बांधने वाली) — विशिष्ट
(दूसरा पुनरोक्तण)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 20 March 1990, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1970. As a result of experience gained during the years, this was first revised in 1973. The present revision has been necessitated to include extra high tensile box strappings.

This standard is based on the manufacturing and trade practices followed in the country in this field.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

COLD ROLLED STEEL STRIPS (BOX STRAPPINGS) — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard covers the requirements for three grades of cold rolled steel strips (tensional steel strappings) for general packaging purposes. These strips are known as box strappings.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
IS 228	Methods for chemical analysis of steels
IS 1403 : 1981	Methods for reverse bend testing of metals (<i>first revision</i>)
IS 1663 : 1972	Method for tensile testing of steel sheet and strip of thickness 0.5 mm to 3 mm (<i>first revision</i>)
IS 8910 : 1978	General technical delivery requirements for steel and steel products
IS 9844 : 1981	Method of testing corrosion resistance of electroplated and anodized aluminium coatings by neutral salt spray test

3 SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of cold rolled steel strips shall conform to IS 8910 : 1978.

4 MANUFACTURE

4.1 The strips shall be manufactured from steel made by any process except the Bessemer process. It may be followed by secondary refining or secondary vacuum melting.

5 CHEMICAL COMPOSITION**5.1 Ladle Analysis**

The ladle analysis of steel, when carried out either by the methods specified in relevant part of IS 228 or any other established instrumental/chemical method, shall be as given in Table 1.

In case of dispute, the procedure given in relevant parts of IS : 228 shall be the referee methods.

Table 1 Chemical Composition

Grade	Constituent, Percent			
	Carbon	Manganese	Sulphur Max	Phosphorous Max
1	0.25-0.35	1.10-1.60	0.050	0.050
2 & 3	0.20 <i>Max</i>	0.90 <i>Max</i>	0.050	0.050

NOTE — The steel may be made with micro-alloying elements like niobium, vanadium, titanium and boron either individually or in combination, on mutual agreement, in which case total micro-alloying elements should not exceed 0.2 percent in ladle analysis. However, in case of boron, the limit shall be 0.1 percent.

5.2 Product Analysis

Permissible variation in the case of product analysis from the limits specified in 5.1 shall be as given in Table 2.

Table 2 Product Analysis

Constituent	Variation Over the Specified Limits, Percent, Max
Carbon	± 0.02
Manganese	± 0.03
Sulphur	+ 0.005
Phosphorous	+ 0.005

NOTE — Variation shall not be applicable to both over and under the specified limits in several determinations in a heat.

6 TENSILE TEST**6.1 Number of Tensile Tests**

One tensile test shall be taken from each lot of 25 tonnes of material or part thereof from each cast.

6.1.1 Where strips of more than one thickness are rolled from the same cast, one tensile test shall be made for each thickness of strip.

6.1.2 Test samples shall be taken from either end of the strips and shall be at least 1.5 metres in length.

6.2 Tensile Test Piece

Tensile test may be carried out on full width of the strip in accordance with IS 1663 : 1972.

6.3 When tested, the tensile strength and percentage elongation shall conform to the requirements given in Table 3.

Table 3 Tensile Properties

Grade	Tensile Strength MPa	Percentage Elongation, Min Gauge Length 50 mm
1	900 Min	5
2	590-900	7
3	290 Min	12

7 REVERSE BEND TEST

7.1 Number of Reverse Bend Tests

One reverse bend test shall be taken from each lot of 10 tonnes of material or part thereof from each cast.

7.1.2 Where strips of more than one thickness are rolled from the same cast, one additional bend test shall be made for each thickness of strip.

7.2 The reverse bend test shall be carried out in accordance with IS 1403 : 1981.

7.2.1 When tested, on a block of 2.5 mm, should give minimum of 2 bends without showing any sign of cracks.

8 RETEST

8.1 Should any of the test pieces first selected fail to pass any of the tests specified in this standard, two further samples shall be selected from the same lot for testing in respect of each failure. Should the test pieces from both these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirements of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be deemed as not complying with this standard.

9 FREEDOM FROM DEFECTS

9.1 The strips shall be free from harmful defects such as scales, rust, blisters, laminations,

pittings, porosity and other harmful defects such as sharp, cracked or torn edges, or any other defects which may impair the serviceability of the strips.

9.2 The degree or amount of surface defects in a coil may be expected to be more than in cut lengths because of the impossibility of rejecting portions of coil. This shall be taken into account by the purchaser in his assessment of the material. An excessive amount of defects may be the cause for rejection.

10 DIMENSIONS AND TOLERANCES

10.1 Unless otherwise specified, cold rolled steel strips shall be supplied in dimensions as agreed to between the purchaser and the manufacturer.

10.2 Tolerances on thickness of cold rolled steel strips shall not exceed the following limits:

Size mm	Permissible Deviation mm
0.30 up to and including 0.80	± 0.04
Over 0.80 up to and including 1.20	± 0.05

10.3 Tolerance on width of cold rolled steel strips shall not exceed ± 0.15 mm.

10.4 For guidance, the combination of width and thickness, which is generally supplied are given in Annex A.

11 SURFACE FINISH

11.1 Steel strips may be supplied, as agreed to between the manufacturer and purchaser, in any one of the following surface finishes. Bright and bluish grey strips shall be adequately coated with rust preventive.

- Bright* — The natural surface finish of uncoated steel in a cold rolled condition.
- Blue/Bluish Grey* — The blue/bluish grey finish is imparted by heat which also cleans the surface.
- Painted* — Various paints are used to provide a degree of resistance to corrosion or to check chemical reaction between the strapping and the surface of the goods being strapped.
- Electro Zinc Galvanized* — A zinc coating is applied by an electrolytic deposition process to provide a degree of resistance to corrosion.
- Hot Dipped Galvanized* — A corrosion resistance coating is applied by immersion in a bath of molten zinc.

- f) *Copper Coated* — A copper coating is applied by electrolytic deposition.
- g) *Epoxy Coating* — The epoxy/epoxy polyester powder coating is applied on to the degreased, pickled and phosphated steel strip by electrostatic process followed by fusion and curing at elevated temperature.

12 CORROSION RESISTANCE

12.1 The finished strip shall be subjected to salt spray test in accordance with IS 9844 : 1981 for the time given below:

- a) Painted (one coat) — 72 hours for air drying quality and 96 hours for stoving quality,
- b) Electro zinc galvanized and hot dip galvanized — 144 hours,

- c) Copper coated — 144 hours, and
- d) Epoxy coating — 500 hours.

13 PACKING

13.1 Strips shall be supplied in coils securely packed in polyethylene bitumen impregnated hessian. Other types of packagings may be used if agreed to between the manufacturer and supplier.

14 MARKING

14.1 Each coil of strip shall be marked with the following:

- a) Grade of the material,
- b) Size, and
- c) Indication of the source of manufacture.

14.2 Standard Marking — Details available with the Bureau of Indian Standards.

ANNEX A

(Clause 10.4)

COMBINATION OF WIDTH AND THICKNESS IN mm

19.0 × 0.63
 19.0 × 0.8
 32.0 × 0.8
 32.0 × 1.0
 32.0 × 1.25
 50.0 × 1.25
 50.0 × 1.30

NOTE — Other size combinations (width and thickness) may also be manufactured subject to agreement between the manufacturer and the purchaser.

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